BRITISH STANDARD

BS EN
934-5:2007

Admixtures for concrete, mortar and grout —

Part 5: Admixtures for sprayed concrete — Definitions, requirements, conformity, marking and labelling

The European Standard EN 934-5:2007 has the status of a British Standard

ICS 91.100.10; 91.100.30

National foreword

This British Standard is the UK implementation of EN 934-5:2007.

The UK participation in its preparation was entrusted by Technical Committee B/517, Concrete, to Subcommittee B/517/3, Admixtures.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Adjuvants pour béton, mortier et coulis - Partie 5 : Adjuvants pour bétons projetés - Définitions, exigences, conformité, marquage et étiquetage

Zusatzmittel für Beton, Mörtel und Einpressmörtel - Teil 5: Zusatzmittel für Spritzbeton - Begriffe, Anforderungen, Konformität, Kennzeichnung und Beschriftung

This European Standard was approved by CEN on 13 August 2007.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN 934-5:2007) has been prepared by Technical Committee CEN/TC 104 “Concrete and related products”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2008, and conflicting national standards shall be withdrawn at the latest by July 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s).

For relationship with EC Directive(s), see informative Annex ZA, which is an integral part of this document.

This European Standard is a part of the series EN 934 *Admixtures for concrete, mortar and grout* which is comprised of the following parts:

Part 1: Common requirements[1)]

Part 2: Concrete admixtures — Definitions, requirements, conformity, marking and labelling

Part 3: Admixtures for masonry mortar — Definitions, requirements, conformity, marking and labelling

Part 4: Admixtures for grout for prestressing tendons — Definitions, requirements, conformity, marking and labelling

Part 5: Admixtures for sprayed concrete — Definitions, requirements, conformity, marking and labelling

Part 6: Sampling, conformity control and evaluation of conformity.

This European Standard is used with the standards of the series EN 480 which comprises test methods for admixtures.

Subject to the provisions in EN 14487-1, *Sprayed concrete – Part 1: Definitions, specifications and conformity* admixtures covered by EN 934-2 may also be considered for the use in sprayed concrete.

A previous draft of EN 934-5 had been submitted to Formal Vote in 2004 and had formally passed the vote by majority of CEN-members in 2005. Together with this vote, however, some members presented severe technical comments which were agreed upon by the relevant CEN/TC 104/SC 3 to be taken into account by an amendment. In order to avoid the need of using two separate papers in practice, CEN/TC 104 decided, however, not to publish the agreed document but to submit a further consolidated version including the amended issues to UAP, which finally should be published.

The amendments to the final draft prEN 934-5:2004-11 are the following:

- Table 1: requirements in line 5 (Conventional dry material content), 7 (Total chlorine) and 8 (Water soluble chloride);

- Table 2: heading of table; curing conditions in footnote [d];

1) This document is under preparation.

- Table 3: heading of table;

- Table 4: heading of table;

- Table 5: minimum frequency of testing of alkali content;

- Annex B: new clauses B.4 and B.5 with more details of testing; new clause B.6, extending the test report;

- Annex C: detailing the testing in clause C.4.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard defines and specifies requirements and conformity for admixtures specifically intended for use in sprayed concrete.

The types of admixtures covered are:

— set accelerating and non-alkaline set accelerating admixtures;

— consistence control admixtures;

— bond improving admixtures.

Provisions governing the practical application of these admixtures in the production of sprayed concrete are not part of this European Standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 196-1, *Methods of testing cement — Part 1: Determination of strength*

EN 196-3, *Methods of testing cement — Part 3: Determination of setting times and soundness*

EN 197-1, *Cement — Part 1: Composition, specifications and conformity criteria for common cements*

EN 480-1, *Admixtures for concrete, mortar and grout — Test methods — Part 1: Reference concrete and reference mortar for testing*

EN 480-2, *Admixtures for concrete, mortar and grout — Test methods — Part 2: Determination of setting time*

EN 480-6, *Admixtures for concrete, mortar and grout — Test methods — Part 6: Infrared analysis*

EN 480-8, *Admixtures for concrete, mortar and grout — Test methods — Part 8: Determination of the conventional dry material content*

EN 480-10, *Admixtures for concrete, mortar and grout — Test methods — Part 10: Determination of water soluble chloride content*

EN 480-12, *Admixtures for concrete, mortar and grout — Test methods — Part 12: Determination of the alkali content of admixtures*

EN 934-6:2001, *Admixtures for concrete, mortar and grout — Part 6: Sampling, conformity control and evaluation of conformity*

EN 1542:1999, *Products and systems for the protection and repair of concrete structures — Test methods — Measurement of bond strength by pull-off*

EN 12350-2, *Testing fresh concrete — Part 2: Slump test*

EN 12350-5, *Testing fresh concrete — Part 5: Flow table test*

EN 12390-3, *Testing hardened concrete — Part 3: Compressive strength of test specimens*

EN ISO 1158, *Plastics — Vinyl chloride homopolymers and copolymers — Determination of chlorine content (ISO 1158:1998)*

ISO 758, *Liquid chemical products for industrial use — Determination of density at 20 degrees C*

ISO 4316, *Surface active agents — Determination of pH of aqueous solutions — Potentiometric method*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1 General definitions

3.1.1
performance
ability of an admixture to be effective in its intended use without detrimental effects

3.1.2
compliance dosage
dosage of an admixture, expressed in % by mass of cement, stated by the manufacturer, which will meet the requirements of this European Standard

NOTE The compliance dosage should be within the recommended range of dosage.

3.1.3
recommended range of dosage
dosages between limits expressed in % by mass of cement that the manufacturer recommends for the product based on experience on site

NOTE The use of the recommended dosage does not imply that compliance with this European Standard will be met over the whole range. Trial tests should be carried out with the materials to be used on site to find the dosage necessary to achieve the required result.

3.1.4
maximum recommended dosage
upper limit of the recommended range of dosage

3.1.5
control mix
prescribed mix without admixture

3.1.6
test mix
prescribed mix incorporating an admixture

3.2 Specific definitions

3.2.1
sprayed concrete admixture
material added to the concrete mix before or during the spraying process, in a quantity not exceeding 5 % by mass of cement, except for sprayed concrete set accelerating admixture, where the dosage should not exceed 12 %, to modify the properties of the mix in the fresh and/or hardened state

3.2.2
sprayed concrete set accelerating admixture
admixture to develop very early setting of the sprayed concrete differing from set accelerating admixtures as defined and specified in EN 934-2

3.2.3
non-alkaline sprayed concrete set accelerating admixture
sprayed concrete set accelerating admixture according to 3.2.2 with an alkali content (given as Na_2O-equivalent) not exceeding 1,0 % by mass of the admixture

3.2.4
consistence control admixture
admixture that retains consistency for a long period

NOTE This type of admixture is normally used in combination with a compatible sprayed concrete set accelerating admixture.

3.2.5
bond improving admixture
admixture added to the concrete mix before or during the process of spraying and which improves the bond between the sprayed concrete layers and/or the substrate surface

4 Requirements

4.1 General requirements

All the admixtures defined in this European Standard shall conform to the general requirements given in Table 1.

NOTE For requirements that lead to the CE-marking, see Table ZA.1.

4.2 Specific requirements

Additional to the general requirements in 4.1, the admixtures defined in 3.2.1 to 3.2.5 shall conform to the following specific requirements:

Sprayed concrete set accelerating admixture	Table 2
Non-alkaline sprayed concrete set accelerating admixture	Table 2
Consistence control admixture	Table 3
Bond improving admixture	Table 4

These requirements shall be satisfied within the recommended range of dosage.

Table 1 — General requirements [i]

	Property	Test method	Requirements
1	Homogeneity [a]	Visual	Homogeneous when used. Segregation shall not exceed the limit stated by the manufacturer.
2	Colour[a]	Visual	Uniform and similar to the description declared by the manufacturer.
3	Effective component [a]	EN 480-6 [b]	Infrared spectra to show no significant change with respect to the effective component when compared to reference spectrum provided by the manufacturer.
4	Relative density [a]	ISO 758	D ± 0,03 if D > 1,10 D ± 0,02 if D ≤ 1,10 Where D is the manufacturer's stated value of density.
5	Conventional dry material content [a]	EN 480-8 [c]	0,95 T ≤ X < 1,05 T, if T ≥ 20 % 0,90 T ≤ X < 1,10 T, if T < 20 % T is manufacturer's stated value % m/m.; X is test result % by mass on dry material content.
6	pH-Value [a] (only for liquid admixtures)	ISO 4316	Manufacturer's stated value ± 1 or within manufacturer's stated range.
7	Total chlorine [a d]	EN ISO 1158 [e]	Either ≤ 0,10 % by mass or not above the manufacturer's stated range.
8	Water soluble chloride [a]	EN 480-10	Either ≤ 0,10 % by mass[h] or not above the manufacturer's stated range.
9	Alkali content (Na_2O-equivalent) [a]	EN 480-12	Not above the manufacturer's stated maximum. ≤ 1,0 % by mass for non-alkaline sprayed concrete set accelerating admixture.
10	Corrosion behaviour	[f g]	No corrosion promotion effects on steel embedded in concrete.

[a] Manufacturer's stated value shall be provided in writing, to the user, on request.

[b] If the method in EN 480-6 is not suitable, the manufacturer shall recommend an alternative test method.

[c] If the method in EN 480-8 is not suitable, the manufacturer shall recommend an alternative test method.

[d] If there is no significant difference between total chlorine content and water soluble chloride content, only the water soluble chloride content shall be determined in subsequent tests on the admixture involved.

[e] The procedure in EN ISO 1158 shall be modified as follows:

— increase the sample size to 0,1 g of dry admixture;

— use silver nitrate and ammonium thiocyanate solutions 0,01 N.

[f] For testing, cement CEM I with C_3A content less than 5 % by mass shall be used.

[g] If admixtures are tested for corrosion behaviour, tests should be performed in accordance with EN 480-14

[h] Where the chloride content is ≤ 0,10 % by mass, the admixture may be described as "chloride free".

[i] Table 1 including European provisions for corrosion behaviour will be incorporated in EN 934-1, "Admixtures for concrete, mortar and grout - Part 1: Common requirements" which is currently under development. Table 1 shall be used when EN 934-1 is published.

Table 2 — Specific requirements for sprayed concrete set acceleration and non-alkaline set acceleration admixtures at equal w/c ratio

	Property	Reference mortar	Test method	Requirements
1	Setting time	Reference mortar EN 480-1 [a b]	EN 480-2 [c]	Initial setting time ≤ 10 min Final setting time ≤ 60 min (average of three tests)
2	Compressive strength	Reference mortar EN 480-1 [a d e]	EN 196-1	At 28 days: Compressive strength of test mix ≥ 75 % compressive strength of control mix or ≥ 90 % for non-alkaline accelerators. At 90 days: Compressive strength of test mix ≥ compressive strength of test mix at 28 days.

[a] The w/c ratio shall be ≤ 0,50 and such that the test mix shall have the standard consistence defined in EN 196-3 immediately prior to addition of the admixture.

[b] In difference to EN 480-1, the set accelerating admixture is added to a cement mortar of standard consistence, just before the end of the mixing time. Adding the admixture, mixing and filling the mould, without undue segregation or vibration, shall be completed in a time not exceeding 30 s.

[c] The difference to EN 480-2, the total mass of the moving parts of the Vicat shall be (300 ± 2) g.

[d] All components of the mortar shall be conditioned to a temperature of (5 ± 1) °C. The test specimen shall be stored at (20 + 2) °C.

[e] The set accelerating admixture is added to the mortar just before the end of the mixing time. The filling and compacting of the mould with the mortar shall then be completed as quickly as possible.

Table 3 — Specific requirements for consistence control admixtures at equal consistence

	Property	Reference concrete	Test method	Requirements
1	Retention of consistence	Annex B	EN 12350-2 (slump) or EN 12350-5 (flow)	Control mix: Initial slump: 180 mm to 230 mm, or initial flow: 480 mm to 550 mm. 6 h after addition of the admixture, the consistence of the test mix shall be ≥ 80 % of the initial consistence of the test mix.
2	Compressive strength	Annex B	EN 12390-3	At 28 days: Compressive strength of test mix ≥ compressive strength of control mix

Table 4 — Specific requirements for bond improving admixtures at equal consistence

	Property	Reference concrete	Test method	Requirements
1	Tensile bond strength	Annex C	Annex C	Tensile bond strength between layers at 28 days: test mix ≥ 125 % of control mix
2	Compressive strength	Annex C	EN 12390-3	At 28 days: Compressive strength of test mix ≥ 80 % of compressive strength of control mix

5 Sampling

Requirements for sampling are given in EN 934-6.

6 Conformity control

Requirements for conformity control are given in EN 934-6:2001, 5.3 and 5.4. The frequency of testing in connection with the factory production control is given in Table 5.

Table 5 — Minimum frequency of test for factory production control

Tests	Set accelerating and non-alkaline set accelerating admixtures	Consistence control admixtures	Bond improving admixtures
Homogeneity, colour	B	B	B
Relative density (for liquids only)	B	B	B
Conventional dry material content	B	B	B
pH value (for liquids only)	B	B	B
Chloride content (Cl^-) [a]	4	4	4
Alkali content	2	2	2
Compressive strength at 28 days	1	1	1
Setting time	A	–	–
Retention of consistence	–	A	–
Tensile bond strength	–	–	A

Numbers in this table denote minimum frequency of test per year, spread according to production; if the production is less frequent every batch has to be tested.

A: means test for every 1 000 t but not more than 3 times a year

B: means test each batch

NOTE The effective component (infrared analysis) need not be included in the programme of factory production control. It has been included in initial type testing.

a Total chlorine content also has to be tested at this frequency if it is significantly different from the water soluble chloride content.

7 Evaluation of conformity

Requirements for evaluation of conformity are given in EN 934-6:2001, Clause 5.

8 Marking and labelling

8.1 General

When admixtures for sprayed concrete are supplied in containers they shall be clearly marked with the relevant information listed in 8.2 and 8.3. When the material is supplied into a bulk container at the point of delivery, the same information shall be provided in writing at the time of delivery.

NOTE For CE-marking and labelling ZA.3 applies.

8.2 Designation of admixtures

Admixtures for sprayed concrete shall be designated by:

a) name of type of admixture in the language of one member country;

b) number of this European Standard: EN 934-5;

c) code, to identify the type of admixture, consisting of the number of this European Standard and the number of the table which gives the additional performance requirements for the particular type of admixture.

EXAMPLE Set accelerating admixture for sprayed concrete; EN 934-5; T.2.

8.3 Additional information

a) batch number and production plant;

b) summary of storage requirements including any special requirements on storage life which shall be clearly marked, e.g.: This admixture shall not be taken to comply with EN 934-5 after "date";

c) instructions for use and any necessary safety precautions, e.g. if caustic, toxic or corrosive;

d) manufacturer’s recommended range of dosage;

e) actions to be taken before use if segregation has occurred.

Annex A
(informative)

Content and release of dangerous substances

NOTE For requirements regarding substances dangerous to health, hygiene and the environment that are relevant for CE-marking, see Note 1 of ZA.1 and text after example in ZA.3.

Annex B
(normative)

Reference concrete for testing consistence control admixture

B.1 General

The constituent materials and the preparation of the reference concrete shall be in accordance with the requirements of EN 480-1 except as given in this annex below. The requirements for the consistence are given in Table 3. All tests shall be carried out at the same consistence.

B.2 Cement content

The cement content shall be 450 kg/m³.

B.3 Aggregates

The sieve curve for the aggregate is given in Table B.1.

Table B.1 — Aggregate for reference concrete

Sieve size mm	Percentage by mass passing the test sieve [a] [b]
8,0	100
4,0	73 to 100
2,0	55 to 90
1,0	37 to 72
0,5	22 to 50
0,25	11 to 26
0,125	4 to 12
0,063	< 2

[a] The range is selected to accommodate both crushed and uncrushed aggregate.

[b] The variation in the quantity passing each sieve of the chosen grading for both mixes (control and test mix) shall not exceed ± 2,0 % by mass.

B.4 Consistence

Testing shall be carried out under standard laboratory conditions of (20 + 2) °C. The concrete shall be covered with a plastic sheet to prevent evaporation during the standing period. The initial consistence of the reference concrete shall be slump (180 mm to 230 mm) or flow (480 mm to 550 mm). This shall apply to both the test and control mixes. The test mix only, shall be re-tested 6 h after mixing and shall have a consistence ≥ 80 % of the initial consistence of the test mix.

B.5 Compressive strength

Following the test for consistence, 6 h after adding the consistence control admixture, the test mix is returned to the mixer. After 60 s mixing the mixer is stopped and the concrete is placed in the compressive strength moulds. The concrete is cured in the moulds under standard laboratory conditions according to EN 12390-2 until it has fully set. It is then de-moulded and curing continued under standard laboratory conditions until the age when it is to be tested for compressive strength.

A control mix at equal consistence (see B.4) is prepared at the same time as the test mix and placed in the compressive strength moulds immediately after mixing. The concrete is cured under normal laboratory conditions and tested for compressive strength at 28 days.

B.6 Test report

The test report shall include at least the following information:

Cement:

— manufacturer and factory;

— type;

— class of strength in accordance with EN 197-1;

Consistence control admixture:

— manufacturer;

— type;

— dosage;

— individual and average results of slump or flow rounded to 5 mm;

— individual and average results of compressive strength tests for control and test mixes.

Annex C
(normative)

Measurement of tensile bond strength

C.1 General

This test is intended for laboratory use only. Test and control concrete mixes are prepared and used to make the following test specimens each consisting of two layers:

a) control concrete to control concrete;

b) test concrete to test concrete.

The test procedure shall follow EN 1542 with the deviations shown in C.3.

C.2 Preparation of the control and test mix

The constituent materials and the preparation of the reference and test concrete shall be in accordance with the requirements of EN 480-1 with deviations as follows:

a) cement content 450 kg/m³;

b) aggregates in accordance with Table B.1;

c) consistence (60 to 80) mm slump or (380 to 420) mm flow.

C.3 Applying the concrete and storage of specimens

All components of the concrete, together with the moulds and tools used for preparing the mix and its application shall be located in the standard laboratory climate (EN 1542) for at least 24 h before use.

The base of the moulds can be of any suitable material but a concrete slab has been found most suitable. Mould sides to contain a uniform 40 mm thickness of concrete are attached to the base.

One mould shall be filled with control concrete and one with test concrete. The concrete shall be compacted by hand tamping, levelled and then finished with a single pass of a steel float. The specimens are then left, uncovered, in the standard laboratory climate.

After 24 h the mould is removed and the surfaces given just sufficient wire brushing to remove any latence. Double height mould sides are then fitted so that a further layer of (30 to 40) mm of concrete can be added.

The control concrete mould shall be filled with a further batch of control concrete. The test concrete mould shall be filled with a further batch of test concrete. The concrete in both moulds shall be compacted by hand tamping, levelled and then finished with a steel float. The specimens are then left, uncovered, in the standard laboratory climate for 24 h before de-moulding. After de-moulding, the specimens are then left, uncovered, in the standard laboratory climate for a further 27 days.

C.4 Testing

The tests shall be carried out in accordance with EN 1542:1999, Clause 7, except that the drill shall pass through the top layer of concrete and approximately 20 mm into the first layer of concrete.

Five bond tests are performed on each test specimen.

C.5 Test report

The test report shall include the following information:

— Cement:

a) manufacturer and factory;

b) type;

c) class of strength (in accordance with EN 197-1).

— Sprayed concrete bond improving admixture:

Manufacturer:

d) type;

e) dosage.

— Tensile bond strength results rounded to 0,05 N/mm²:

Individual by specimen type:

f) average by specimen type;

g) average test specimen failure as percentage of average control specimen failure strength.

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

ZA.1 Scope and relevant characteristics

This European Standard and this Annex ZA have been prepared under a mandate[2)] given to CEN by the European Commission and the European Free Trade Association.

The clauses of this and, where relevant, another European Standard shown in this Annex meet the requirements of this mandate given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the admixtures for sprayed concrete covered by this Annex for the intended uses indicated herein: reference shall be made to the information accompanying the CE marking.

WARNING — Other requirements and other EU Directives, not affecting the fitness for intended uses, can be applicable to the admixtures for sprayed concrete falling within the scope of this annex.

NOTE 1 In addition to any specific clauses relating to dangerous substances contained in this standard, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

NOTE 2 An informative database of European and national provision on dangerous substances is available at the construction web site on EUROPA, accessed through http://europa.eu.int/comm/enterprise/construction/internal/dangsub/dangmain.htm.

This Annex establishes both the conditions for the CE-marking of the construction products intended for the uses indicated in Table ZA.1 and the relevant clauses applicable:

This Annex has the same scope as Clause 1 of this standard and is defined by Table ZA.1

2) M 128 "Products related concrete, mortar and grout" as amended.

Table ZA.1 — Scope and relevant clauses of this standard

Product:	Admixtures for sprayed concrete		
Intended use(s):	To be used in sprayed concrete for:	- set accelerating, - consistence control - bond improving	
Essential characteristics	**Requirement clauses in this standard**	**Mandated level(s) or class(es):**	**Notes**
Chloride ion content	Clause 4 and Table 1 (7) (8)	None	Applies to all admixtures within the scope of this standard. Requirements are for upper limit or maximum declared value.
Alkali content	Clause 4 and Table 1 (9)	None	Applies to all admixtures within the scope of this standard. Requirements are for upper limit or maximum declared value.
Corrosion behaviour	Clause 4 and Table 1 (10)	None	Applies to all admixtures. Provisions may be given in the place of use.
Compressive strength	Clause 4 and Tables 2 (2), 3 (2) and 4 (2)	None	Applies to all admixtures within the scope of this standard. Requirements are for lower limits in test mix (with admixture).
Setting time	Clause 4 and Table 2 (1)	None	Applies to set accelerating admixtures only. Requirement for a lower limit in test mix (with admixture).
Retention of consistency	Clause 4 and Table 3 (1)	None	Applies to consistence control admixtures only. Requirements for an upper and lower limit in test mix (with admixture).
Tensile bond strength	Clause 4 and Table 4 (1)	None	Applies to bond improving admixtures only. Requirement is for a lower limit in test mix (with admixture).
Release of dangerous substances			Applies to all admixtures within the scope of this standard. Requirements are dependant on regulations in the place of use.
Durability			Durability relates to the concrete incorporating the admixtures.

The requirement on a certain characteristic is not applicable in those Member States (MSs) where there are no regulatory requirements on that characteristic for the intended use of the product. In this case, manufacturers placing their products on the market of these MSs are not obliged to determine nor declare the performance of their products with regard to this characteristic and the option "No performance determined" (NPD) in the information accompanying the CE marking (see ZA.3) may be used. The NPD option may not be used, however, where the characteristic is subject to a threshold level.

ZA.2 Procedure for attestation of conformity of admixtures for sprayed concrete

ZA.2.1 System of attestation of conformity

The system of attestation of conformity for the admixtures for sprayed concrete indicated in Table ZA.1, in accordance with the decision of the Commission of 1999/469/EC as amended by the Commission decision 01/596/EC as given in Annex III of the mandate M/128 "Products related to concrete, mortar and grout", is shown in Table ZA.2 for the indicated intended use:

Table ZA.2 — System of attestation of conformity

Product(s)	Intended use	Level(s) or class(es)	Attestation of conformity system
Admixtures	For sprayed concrete	–	2+
System 2+: See Directive 89/106/EEC (CPD) Annex III.2 (ii), First possibility, including certification of the factory production control by an approved body on the basis of initial inspection of factory and of factory production control as well as of continuous surveillance, assessment and approval of factory production control.			

The attestation of conformity of admixtures for sprayed concrete in Table ZA.1 shall be based on the evaluation of conformity procedures in Table ZA.3 resulting from application of the clauses of this or other European standard indicated therein.

Table ZA.3 — Assignment of evaluation of conformity tasks

Tasks			Content of the task	Clauses to apply
Tasks for the manufacturer	Factory production control (F.P.C)		Parameters related to all relevant characteristics of Table ZA.1	Clause 6 of this standard; EN 934-6:2001, Clause 4 EN 934-6:2001, 5.4
	Initial type testing		All relevant characteristics of Table ZA.1	EN 934-6:2001, Clause 4 EN 934-6:2001, 5.3
	Further testing of taken samples at the factory		All relevant characteristics of Table ZA.1	EN 934-6:2001, 5.4.4.4
Tasks for the notified body	Certification of F.P.C on the basis of	Initial inspection of factory and of F.P.C	Parameters related to all relevant characteristics of Table ZA.1.	Clause 6 of this standard; EN 934-6:2001, 5.4
		Continuous surveillance, assessment and approval of F.P.C.	Parameters related to all relevant characteristics of Table ZA.1.	Clause 6 of this standard; EN 934-6:2001, 5.5 and EN 934-6:2001, Annex A

ZA.2.2 EC certificate and declaration of conformity

When compliance with the conditions of this Annex is achieved, and once the notified body has drawn up the certificate mentioned below, the manufacturer or his agent established in the EEA shall prepare and retain a declaration of conformity, which entitles the manufacturer to affix the CE-marking. This declaration shall include:

— name and address of the manufacturer, or his authorised representative established in the EEA. and place of production;

— description of the product (Trade name, type, identification, use,...), and a copy of the information accompanying the CE-marking;

— provisions to which the product conforms (e. g. Annex ZA of this EN);

— particular conditions applicable to the use of the product (e. g. provisions for the use of the product under certain conditions, etc.);

— number of the accompanying factory production control certificate;

— name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or his authorised representative.

The declaration shall be accompanied by a factory production control certificate, drawn up by the notified body, which shall contain, in addition to the information above, the following:

— name and address of the notified body;

— number of the factory production control certificate;

— conditions and period of validity of the certificate, where applicable;

— name of, and position held by, the person empowered to sign the certificate.

The above mentioned declaration and certificate shall be presented, on demand, in the official language or languages of the Member State in which the product is to be used.

ZA.3 CE marking and labelling

The manufacturer or his authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EEC and shall be done on the packaging of the product (when not possible it shall be done on the accompanying label or on the accompanying documents e.g. delivery note). The following information on the product and on its relevant essential characteristics shall accompany the CE-marking symbol:

— identification number of the notified body;

— name or identifying mark and registered address of the producer;

— last two digits in which the marking is affixed;

— number of the EC Certificate of conformity or factory production control certificate (if relevant);

— reference to the European Standard;

— description of the product in accordance with 8.2;

— Information on the relevant essential characteristics in Table ZA.1, which are to be declared, presented as:

— declared values;

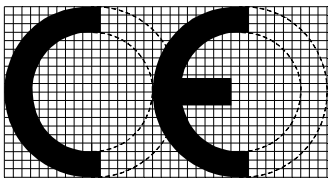
— an alternative, values presented as standard designations, in accordance with 8.2;

— use of the "No performance determined" (NPD) option when relevant.

The "No performance determined" (NPD) option may not be used where the characteristic is subject to a threshold level in the Member State of destination. Otherwise, the NPD option may be used when and where the characteristic, for a given intended used is not subject to regulatory requirements.

Figure ZA.1 gives an example of the information to be given on the product, label packing and/or commercial documents.

For admixtures for sprayed concrete the following information shall accompany the CE marking symbol:



0123-CPD-0001

AnyCo Ltd, PO Box 21, B-1050

07

0123-CPD-0456

EN 934-5

Set accelerating admixture for sprayed concrete

EN 934-5, T.2

chloride content: .....% by mass

alkali content:.....% by mass

Corrosion behaviour[3)] : NL decree YY/nn (yy-mm-dd)

Dangerous substances: NL decree ZZ/pp (yy-mm-dd)

CE conformity marking, consisting of the "CE"-symbol given in directive 93/68/EEC

Identification number of the inspection body

Name or identifying mark and registered address of the producer

Last two digits of the year in which the marking was affixed

Number of the certificate factory production control

No. of European Standard

Description

and

information on regulated characteristics

Figure ZA.1 —Example CE-marking information

In addition to any specific information relating to dangerous substances from hardened concrete shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

NOTE European legislation without national derogations need not be mentioned.

3) Only required when placed on the market in a member state which regulates this item.

Bibliography

[1] EN 480-14, Admixtures for concrete, mortar and grout — Test methods - Part 14: Determination of the effect on corrosion susceptibility of reinforcing steel by potentiostatic electro-chemical test

[2] EN 14487-1, Sprayed concrete – Part 1: Definitions, specifications and conformity

[3] EN 934-2, Admixtures for concrete, mortar and grout — Part 2: Concrete admixtures — Definitions, requirements, conformity, marking and labelling

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